

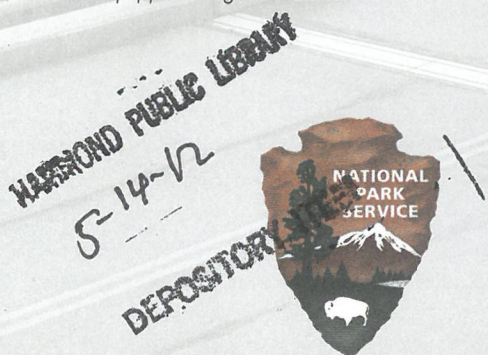
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# HAER

## HISTORIC AMERICAN ENGINEERING RECORD



Baltimore & Ohio Railroad, Locust Point Float Bridges, Baltimore, Maryland, Jet Lowe, photographer, 2011. A vestige of railroad infrastructure, this floatbridge was once used to transfer freight cars onto rail-equipped barges called carfloats.



## DOCUMENTING AMERICA'S ENGINEERING LEGACY

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### What are historic engineering and industrial resources?

Historic engineering and industrial resources encompass a rich array of sites, structures, and artifacts, including transportation systems and infrastructure; industrial buildings, machinery and processes; power generation and public utilities; maritime resources and watercraft; and launching pads and space craft. They range in complexity from the irrigation ditches of the Anasazi on the Colorado Plateau and covered bridges in New England to NASA's wind tunnels and the Hanford Nuclear Reservation in Washington State. Engineering and industrial resources are ubiquitous: drive along almost any road or highway, through large cities and small towns, along the coasts, through the heartland, deserts and forests, and you will see historic engineering and industrial sites, both active and abandoned, that vividly illustrate the American fascination with and dependence on technology and its implementation.

### Why should we care about historic engineering sites?

Historic engineering and industrial sites reflect our nation's rich technological heritage. Every generation of Americans has sought to transform the country's landscape and utilize its resources by constructing a wide variety of engineering sites like irrigation ditches, canals, roads and bridges, mines, factories, power plants, and water and sewage treatment facilities. In addition to infrastructure, our technological heritage is comprised of innovations in machinery and equipment as well as in the development of modes of transportation. The nation's historic engineering and industrial sites remind us of our path to the present and provide examples for the future. Most importantly, these sites encapsulate the contributions of every member of our society, evoking the intellect, ingenuity, hard work, and sacrifice of engineers and inventors, workers and businessmen and women, their families and communities. A permanent record of these sites and accomplishments ensures that they will remain available for future generations to appreciate and learn from, long after they have been lost or forgotten.

### What is happening to our engineering legacy?

Unfortunately, our nation's engineering legacy is subject to loss from many forces, particularly obsolescence through technological advances and developmental pressures, working individually or in tandem. Changing regulations governing health, environment, and safety have also contributed to obsolescence, while overseas manufacturing and the adoption of new materials have impacted equipment and manufacturing plants. As a result, our engineering legacy as manifested through processes and equipment continues to be lost despite increasing interest in adaptive reuse of historic structures.



Western Maryland Railway, Cumberland Extension, Bridge No. 1396, Fourth Potomac and Second B&O Crossing, Maryland, Jet Lowe, photographer, 2010. HAER often works with national parks to document their historic engineering resources, such as the Western Maryland Railway, part of Chesapeake & Ohio Canal National Historical Park.

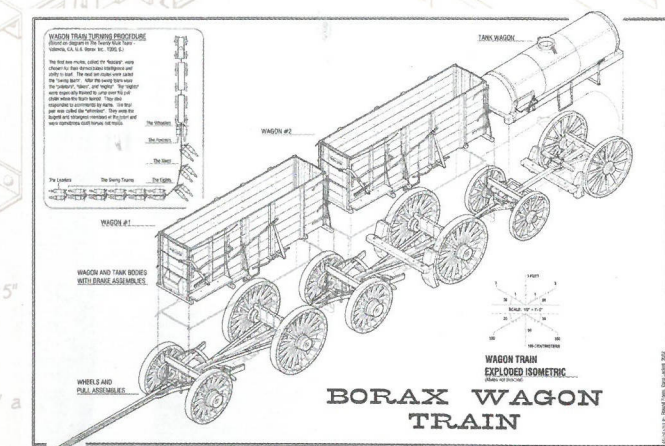
BACKGROUND IMAGE

Blue Ridge Parkway, North Carolina, David Haas, photographer, 1996-1997. HAER undertook a multi-year project documenting National Park Service roads and bridges, including the Linn Cove Viaduct, which has the distinction of being the first precast concrete segmental viaduct built using the progressive method in the United States.

## DOCUMENTING AMERICA'S ENGINEERING LEGACY

### The Historic American Engineering Record

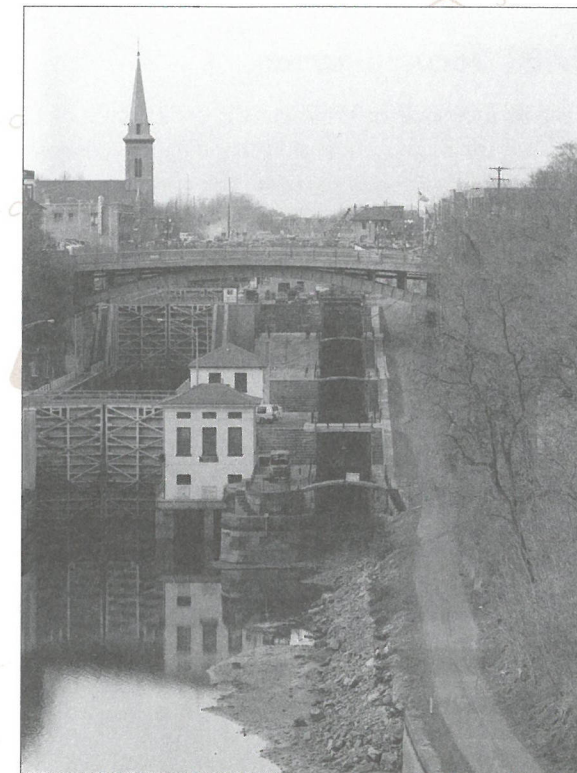
In 1969, the National Park Service (NPS), the American Society of Civil Engineers, and the Library of Congress (LoC) established the Historic American Engineering Record (HAER) to create a permanent documentary record of the nation's engineering and industrial legacy. The agreement was later ratified by four other engineering societies: the American Society of Mechanical Engineers, the Institute of Electrical and Electronic Engineers, the American Institute of Chemical Engineers, and the American Institute of Mining, Metallurgical and Petroleum Engineers. Under the agreement, the NPS administers the HAER program with funds appropriated by Congress and supplemented by donations from outside sources. The NPS sets qualitative standards and organizes and staffs recording projects. The LoC curates the records, makes them available free of charge for study both at the library and on its Prints and Photographs website, and provides reproductions to the public via downloadable files. The engineering societies offer professional counsel through their History and Heritage Committees and national memberships.



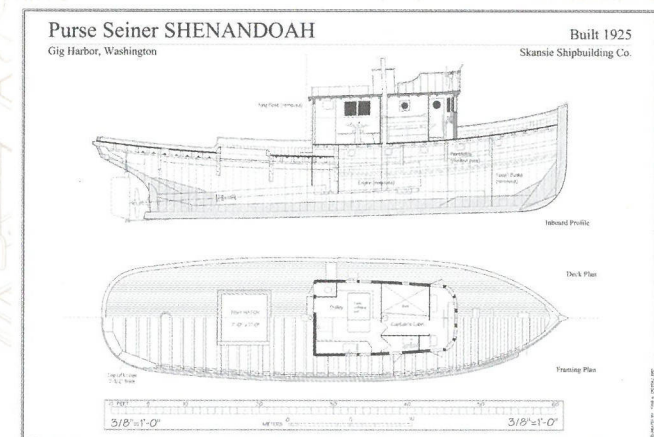
Twenty Mule Team Borax Wagons, Death Valley, California, Borax Wagon Train, Roland Flores and Dana Lockett, delineators, 2002. Twenty-mule teams pulled massive wagons loaded with borax from Death Valley to the railroad in Mojave.

BACKGROUND IMAGE

Hayden Bridge, Springfield, Oregon, Connection Details, Todd A. Croteau, Richard L. Koochagian, Gretchen Van Dusen, and Rafael Villalobos S., delineators, 1990. The bridge incorporates two features that were milestones in the history of wrought-iron bridge building: the Whipple-Murphy truss and the Phoenix column.



New York State Barge Canal, Lockport Locks, Lockport, New York, Jet Lowe, photographer, 2006. Developments in technology are depicted in this photograph of the flights of locks from the enlarged Erie Canal dating to the nineteenth century on the right and early twentieth century electrically-powered locks on the New York State Barge Canal on the left.



Purse Seiner Shenandoah, Gig Harbor, Washington, Todd A. Croteau, delineator, 2007. Built by Skansie Shipbuilding Company, the Shenandoah is a wooden purse seiner that operated as part of the renowned commercial fishing fleet from Gig Harbor, Washington.

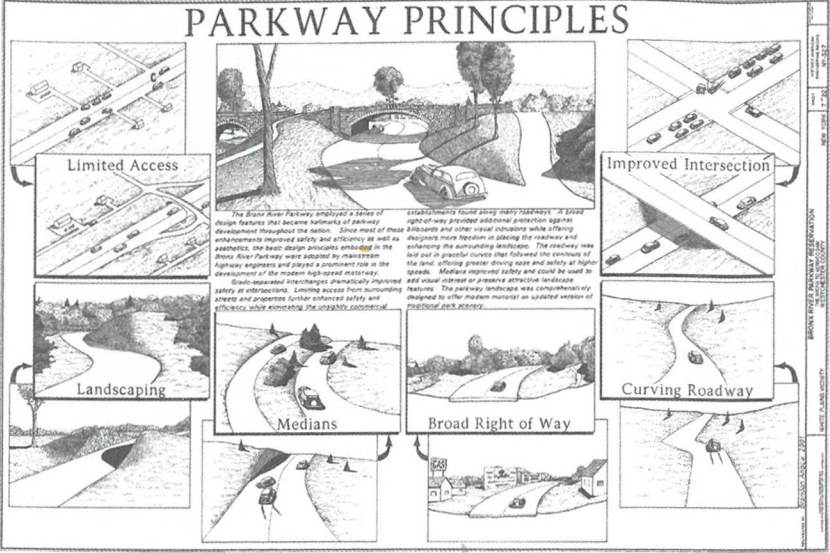


HAER Documentation

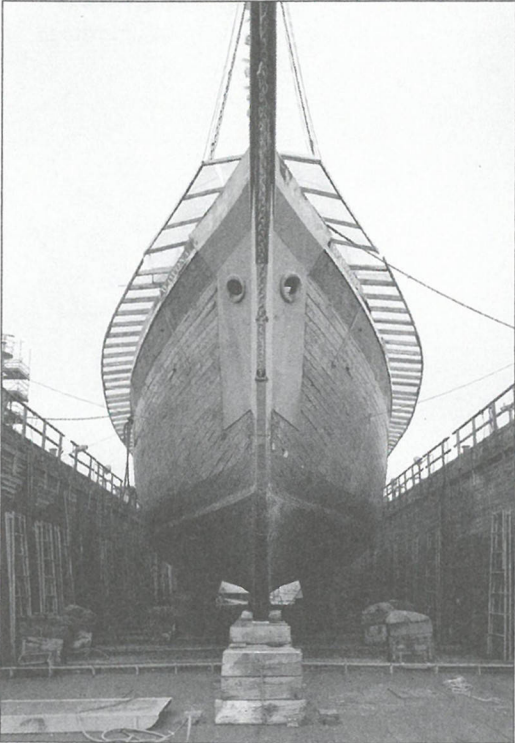
Since its inception in 1969, HAER documentation has followed the basic format of Historic American Buildings Survey (HABS) documentation, the program after which it was modeled, with one important difference: HAER often documents process, such as how machinery worked, bridge components fit together, or a plant functioned to produce a good or service. The formal documentation consists of measured and interpretive drawings, historical reports, and large-format photographs. All HAER documentation, as well as that from companion HABS and Historic American Landscapes Survey (HALS) programs, shares four characteristics: explains and/or illustrates the site's significance; is accurate and verifiable; is stored on archival media tested for a 500-year lifespan that is also reproducible; and is clear and concise. Guidelines for meeting these standards, formally the *Secretary of the Interior's Standards for Architectural and Engineering Documentation*, are available on line at the HAER website.

Drawings can include plans, elevations, sections, axonometrics, schematics, or interpretive illustrations that depict the evolution of the site. Depending on the size and complexity of the site or structure and the time allocated for fieldwork, measurements can be taken by hand, total station, or three-dimensional laser scanning. The drawings are then produced using Computer Aided Drafting (CAD). The written report uses field work and primary and secondary sources to develop a physical description of the resource and trace changes over time. In addition, it includes contextual information to convey the significance of the site or structure and an explanation of the process in use. Finally, large-format, black-and-white photographs depict the current condition of the site or structure and the landscape on which it is located.

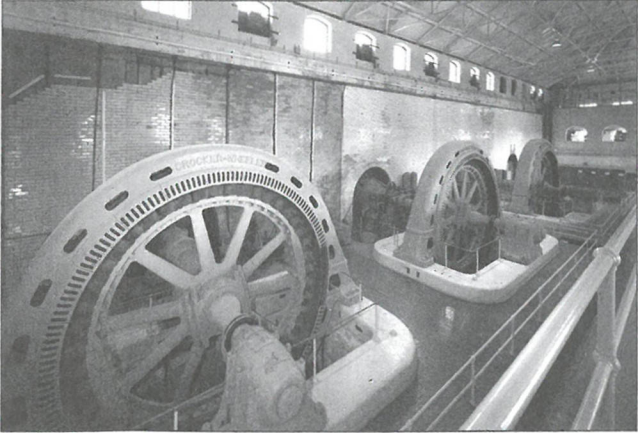
Not only does HAER documentation provide a comprehensive view of a resource for posterity, but it also serves as baseline documentation for rehabilitation and restoration projects. Documentation is also used as the basis for interpretive materials and to illustrate all types of publications. Not surprisingly, the HABS/HAER/HALS collection is among the most heavily-used at the Library of Congress' Division of Prints and Photographs.



Bronx River Parkway Reservation, White Plains vicinity, New York, Parkway Principles, Brandon Andow, delineator, 2001. The Bronx River Parkway was the first public parkway designed explicitly for automobile use.

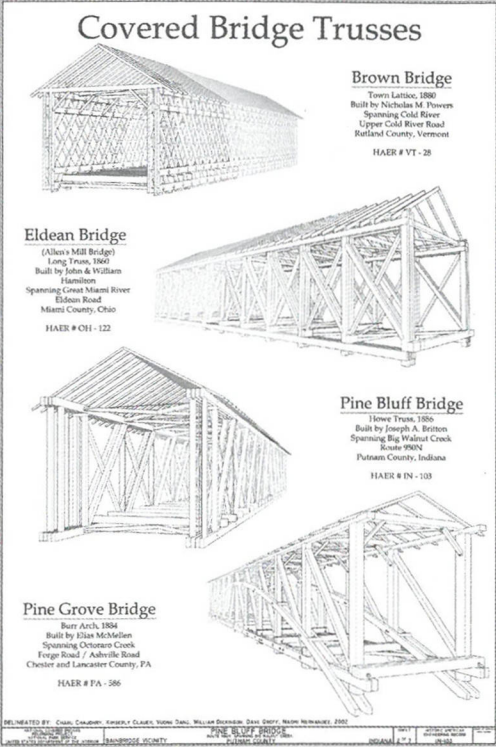


Schooner Wawona, Seattle, Washington, Jet Lowe, photographer, 1985. The Wawona was one of the last surviving three-masted lumber schooners prior to its dismantling in 2009.



Chicago Sanitary and Ship Canal, Lockport Power House and Dam, Lockport vicinity, Illinois, Jet Lowe, photographer, 2009. Crocker-Wheeler generators remain in the Lockport Power House on the Chicago Sanitary and Ship Canal.

Magnolia Plantation Cotton Gins & Presses, Natchitoches vicinity, Louisiana, Ginning Process, Thomas Behrens, delineator, 1997. The Magnolia plantation gin house contains one of only two known examples of an enclosed, wood-screw cotton press.



Covered Bridge Trusses, Charu Chaudhry, Kimberly Clauer, Vuong Dang, William Dickinson, Dave Groff, and Naomi Hernandez, delineators, 2002. HAER has been documenting the development of wooden trusses in covered bridge construction as part of the National Covered Bridges Recording Project.



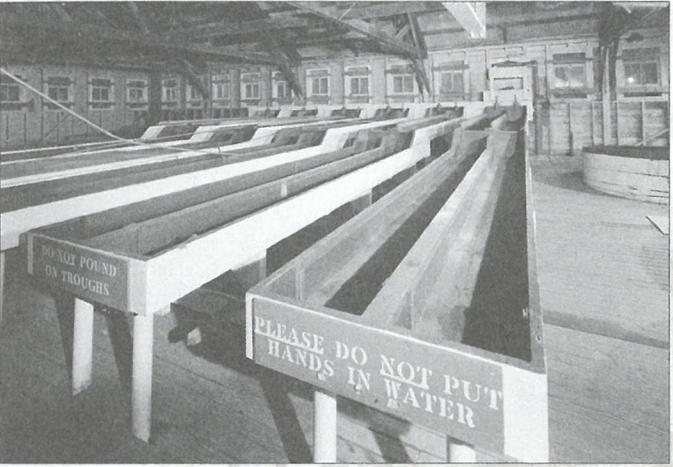
NASA Marshall Space Flight Center, F-1 Engine Static Test Stand, Huntsville vicinity, Alabama, Jet Lowe, photographer, 2009. HAER has had a long-term partnership with Marshall Space Flight Center documenting its national landmarks and other historic resources.

HAER documentation comes from a variety of sources. In addition to staff working with sponsors, HAER runs twelve-week summer projects that train students in undertaking field work, preparing measured drawings, and researching and writing historical reports. HAER documentation is also produced under the provisions of the National Historic Preservation Act of 1966, as amended, which requires that historic sites or structures threatened with adverse action (demolition or alteration) from federally-funded initiatives and listed or eligible for listing in the National Register of Historic Places be documented to HABS/HAER/HALS standards. The mitigation program is administered by the NPS regional offices. Finally, HAER accepts donations of documentation that meets the program's standards. Every historic site that is of national, regional, or local significance has a place in the HABS/HAER/HALS collections at the Library of Congress.

Houston Astrodome, Houston, Texas, Jet Lowe, photographer, 2004. Dubbed the "Eighth Wonder of the World," the Houston Astrodome is significant as the first stadium for both baseball and football that was totally enclosed and fully air-conditioned.



Statue of Liberty, New York, New York, HAER office. Point cloud data is produced from a high-definition laser scanner.



Prairie Creek Fish Hatchery, Orick, California, Jet Lowe, photographer, 2005. A small-scale fish hatchery located in northern California, this site was one of the last built prior to a major state program of modernization and mechanization that began in 1947.

For more information about the HAER program, or to access the HAER Guidelines for Drawings, History, or Photographs, visit our website at <http://www.nps.gov/history/hdp/>.

Visit us on Facebook at <http://www.Facebook.com/HeritageDocumentationPrograms>

The HAER Collection is available through the Library of Congress, Prints and Photographs Division via the internet at <http://loc.gov/pictures/collection/hh/>.